

What is claimed is:

1. An energy conversion apparatus comprising:

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a heat conductive base;

a heat insulating cover operable to mate with the base so as to form a sealed space bounded by the cover and the base to prevent ingress of moisture; and

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a mount inside the space, for securing an energy conversion circuit to at least one of said cover and said base.

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2. The apparatus as claimed in claim 1 further comprising a vent in at least one of said base and said cover for venting humid air from said space.

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3. The apparatus as claimed in claim 2 wherein said vent is located in said base.

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4. The apparatus as claimed in claim 3 wherein said vent includes a moisture permeable membrane allowing moisture to pass from said space to an area outside the apparatus.

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5. The apparatus as claimed in claim 1 further comprising a drain for draining liquid from inside said space.

6. The apparatus as claimed in claim 5 wherein said drain comprises an opening in said base and a resilient seal covering said opening, said resilient seal being movable in response to a pressure difference

between said sealed space and ambient pressure to allow fluid to pass through said opening.

7. The apparatus as claimed in claim 1 wherein one of said base and said cover has sealable openings through which electrical conductors may pass.
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8. The apparatus as claimed in claim 1 wherein said base is formed from metal.
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9. The apparatus as claimed in claim 1 wherein said base has means for mounting said apparatus to a battery mount.
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10. The apparatus as claimed in claim 1 wherein said base has a transformer mount, for mounting a transformer of said energy conversion device.
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11. The apparatus as claimed in claim 1 wherein said cover is formed from plastic.
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12. The apparatus as claimed in claim 1 further comprising an energy conversion circuit mounted in an airspace inside said sealed space.
13. The apparatus as claimed in claim 12 wherein said energy conversion circuit includes a plurality of switching devices configured to reduce heat generation sufficient to permit said energy conversion circuit to operate while said apparatus is in an ambient temperature range between about -40 degrees centigrade to about +85 degrees centigrade.
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14. The apparatus of claim 13 wherein said plurality of switching devices comprises a plurality of transistors connected in parallel.

- 5 15. The apparatus as claimed in claim 13 wherein said energy conversion circuit further includes a transformer configured to reduce heat generation sufficient to permit said energy conversion circuit to operate while said apparatus is in an ambient temperature range between about -40 degrees centigrade to about +85 degrees centigrade.
- 10 16. The apparatus as claimed in claim 1 wherein said apparatus has a generally rectangular parallelepiped shape.
- 15 17. The apparatus as claimed in claim 1 wherein said apparatus has a battery form factor enabling the apparatus to occupy a space occupiable by a battery.
- 20 18. The apparatus of claim 17 further comprising securing means for securing the apparatus in said space occupiable by a battery.
- 25 19. The apparatus as claimed in claim 12 wherein said energy conversion circuit includes a plurality of circuit boards and a vibration damper for dampening vibrations of said circuit boards.
- 30 20. The apparatus as claimed in claim 19 wherein said vibration damper includes supports extending between said circuit boards.
21. The apparatus as claimed in claim 12 wherein said energy conversion circuit includes a plurality of circuit boards and wherein mount includes holders in said base and in said cover for holding said circuit boards of said energy conversion device in spaced apart relation.
22. The apparatus as claimed in claim 21 wherein said holders permit one circuit board to move relative to the other, facilitating sealing between

components on said circuit boards and said cover while permitting access to said components, from outside the cover.

- 5 **23.** The apparatus as claimed in claim 22 further comprising a vibration damper for dampening vibrations of said circuit boards.
- 10 **24.** The apparatus as claimed in claim 23 wherein said vibration damper includes a support extending between said circuit boards.
- 15 **25.** The apparatus as claimed in claim 24 wherein said support includes a guide and wherein at least one of said circuit boards has an opening for co-operating with said guide to guide said at least one circuit board in sliding movement relative to the other.
- 20 **26.** The apparatus as claimed in claim 12 wherein said energy conversion circuit includes an inverter.
- 27.** The apparatus as claimed in claim 12 wherein said energy conversion circuit includes a charger.
- 28.** The apparatus as claimed in claim 12 wherein said energy conversion device comprises a combination charger and inverter.